Climate change not only poses one of the greatest threats to humankind in the 21st century but also is projected to have a disproportionately large effect on agriculture. For example, in Ghana temperatures are projected to increase by 0.6°C, 2.0°C and 3.9°C by the year 2020, 2050 and 2080 respectively while rainfall, has been predicted to decrease by 2.8%, 10.9% and 18.6% over the same period. Ghanaian farmers, like many other African countries, are therefore, highly vulnerable to climate change unless they can adapt. The objective of this study is to explore the socio-economic, institutional and biophysical factors that influence the climate adaptation strategies used by farmers in Ghana. This research began with an analysis of rainfall (1971-2000) and yield data (1992-2007) to identify communities that were in the past “vulnerable” (defined as occurring when relatively minor perturbations in rainfall had large impacts on crop yields) and “resilient” (where even large rainfall perturbations had only minor impacts on crop yields). Results of this phase showed that although most regions of Ghana are vulnerable to changes in the climate, the Northern parts of the country are most vulnerable. Phase II of this research involved characterising these vulnerable and resilient farming communities and results of this phase showed that vulnerable farming communities have households who rely on fragile agro-ecosystems and poor soil fertility. In economic terms, vulnerable regions also practice subsistence agriculture, and are largely dependent on agriculture as the main source of livelihood. Finally, vulnerable communities are characterised by high poverty levels, low levels of institutions and few social security nets. On the contrary, data reveals that resilient farming communities or households tend to have robust agro-ecosystems, practice mechanised commercial farming, have good soil fertility, moderate poverty levels, high social cohesion and security nets, and array of livelihoods options. Phase III of this research involved assessing the adaptation strategies adopted by these different types of communities. The primary result is that adaptation strategies including early planting, diversification of crops and the use of traditional indigenous knowledge are practiced in both the vulnerable and resilient farming communities. However, there were certain adaptation strategies that were specific to either the vulnerable or resilient farming community. For instance, whilst the vulnerable farming communities employ temporary migration, shea-butter picking, hat-waving, changing diets, exchange of food and sand wining as some of the specific adaptation strategies, the resilient farming communities or households employ a combination of crop rotation, reliance on non-farm income and the use of drought tolerant crops such as cassava to cope and adapt to climate change. This research concludes that the choice of a particular climate adaptation strategy is greatly influenced by the characteristics of the farming community. By characterising food production systems, this study seeks to provide a theoretical understanding of food systems vulnerability that will help guide more general discussions of the sorts of food production systems that should be better able to adapt to future climate changes.